REMARKS

Prior to the present amendment, claims 18-47 were pending in the present application. By the present amendment, independent claims 18, 25, and 36 have been amended to overcome the Examiner's objections. Thus, claims 18-47 remain in the present application and claims 46-47 have been allowed. Reconsideration and allowance of outstanding claims 18-45 in view of the above amendments and the following remarks are requested.

A. Rejection of Claims 18-22, 24-40, and 42-45 under 35 USC §103(a)

The Examiner has rejected claims 18-22, 24-40, and 42-45 under 35 USC §103(a) as being unpatentable over alleged Applicant's "admitted prior art." For the reasons discussed below, Applicant respectfully submits that the present invention, as defined by amended independent claims 18, 25, and 36, is allowable.

The present invention, as defined by amended independent claims 18 and 36, includes, among other things, a base comprising kinetically controlled growth mode single crystal silicon-germanium, a base contact comprising mass controlled growth mode polycrystalline silicon-germanium, where the base contact and the base are characterized by a controlled deposition ratio, "wherein said controlled deposition ratio provides a base contact deposition rate that is higher than a base deposition rate so as to cause a base contact thickness to be greater than a base thickness." As disclosed in the present application, a base contact comprising polycrystalline silicon-germanium is grown in a

mass controlled growth mode during a nonselective process of epitaxial growth in which a base comprising single crystal silicon-germanium is grown.

As disclosed in the present application, the present invention takes advantage of the fact that the polycrystalline growth in the mass controlled growth mode is a stronger function of pressure and precursor gas flow rate to achieve control over polycrystalline silicon-germanium growth in the base contact independent of the single crystal silicon-germanium growth in the base. Thus, as disclosed in the present application, at lower temperatures, for example at 650° C, the present invention achieves growth of polycrystalline silicon-germanium in the base contact without causing a substantial growth in the single crystal silicon-germanium base. As disclosed in one embodiment in the present application, the present invention achieves a polycrystalline silicon-germanium base contact that grows twice as fast as a single crystal silicon-germanium base.

Thus, by providing a method for controlling the deposition of polycrystalline material independently of the deposition of single crystal material in a silicon-germanium nonselective epitaxial process, the present invention achieves a base contact thickness that is greater than a base thickness. Thus, the present invention advantageously provides a base does not exceed a critical thickness for a particular germanium concentration while providing a base contact that has an increased thickness for reduced base contact resistance. Thus, by controlling the rate of polycrystalline silicon-germanium base contact deposition independently of the rate of single crystal silicon-germanium base

deposition in a nonselective deposition process, the present invention advantageously provides a base contact thickness that can be selected to achieve a desirably low contact resistance while independently optimizing base thickness for a particular germanium concentration.

On page 2 of the Final Rejection dated March 15, 2005, the Examiner states that pages 2-5 of the present application (i.e. "Background Art" section of the present application) teach a structure comprising a single crystal silicon-germanium base and a polysilicon base contact, where the base contact and the base are inherently characterized by a deposition ratio. However, Applicant respectfully submits that pages 2-5 of the present application fail to teach, disclose, or remotely suggest a base comprising kinetically controlled growth mode single crystal silicon-germanium, a base contact comprising mass controlled growth mode polycrystalline silicon-germanium, where the base contact and the base are characterized by a controlled deposition ratio, where the controlled deposition ratio provides a base contact deposition rate that is higher than a base deposition rate so as to cause a base contact thickness to be greater than a base thickness, as specified in amended independent claims 18 and 36.

As discussed above, the present invention advantageously achieves independent control of the base thickness and base contact thickness by controlling the deposition ratio of the rate of polycrystalline silicon-germanium base contact deposition to the rate of single crystal silicon-germanium base deposition. Thus, by providing a polycrystalline silicon-germanium base contact deposition rate that is higher than a single crystal silicon-

germanium base deposition rate, the present invention can advantageously provide a sufficiently thick, low resistance base contact and an optimized base thickness that does not exceed a critical thickness.

In contrast, pages 2-5 of the present application disclose a conventional deposition process that is performed at temperatures and pressures that do not allow independent control to base thickness and base contact thickness. Thus, by increasing the base contact thickness in the conventional deposition process disclosed on pages 2-5 of the present application, the base thickness is also increased. Thus, the present invention, as defined by amended independent claims 18 and 36, advantageously achieves a controlled deposition ratio that provides a base contact deposition rate that is higher than a base deposition rate so as to cause a base contact thickness to be greater than a base thickness. In contrast, the conventional deposition process disclosed on pages 2-5 of the present application does not and cannot provide a controlled deposition ratio where a base contact deposition rate that is higher than a base deposition rate so as to cause a base contact thickness to be greater than a base thickness. Thus, the present invention, as defined by amended independent claims 18 and 36, provides definite structure differences that are not taught, disclosed, or remotely suggested on pages 2-5 of the present application, as suggested by the Examiner.

For the foregoing reasons, Applicant respectfully submits that the present invention, as defined by amended independent claims 18 and 36, is patentable. As such, claims 19-24 depending from amended independent claim 18 and claims 37-45 depending

from amended independent claim 36 are, *a fortiori*, also patentable for at least the reasons presented above and also for additional limitations contained in each dependent claim.

Amended independent claim 25 includes similar limitations as amended independent claims 18 and 36. Thus, for similar reasons as discussed above, the present invention, as defined by amended independent claim 25 is also patentable. As such, claims 26-35 depending from amended independent claim 25 are, *a fortiori*, also patentable for at least the reasons presented above and also for additional limitations contained in each dependent claim.

B. Conclusion

Based on the foregoing reasons, the present invention, as defined by amended independent claims 18, 25, and 36, and claims depending therefrom, is patentably distinguishable over the art cited by the Examiner. Thus, claims 18-45 are patentably distinguishable over the art cited by the Examiner. For all the foregoing reasons, an early allowance of outstanding claims 18-45 and an early Notice of Allowance for all claims 18-47 are respectfully requested.

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Respectfully Submitted,
FARJAMI & FARJAMI LLP

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Michael Farjami, Esq.
Reg. No. 38,135

FARJAMI & FARJAMI LLP
26522 La Alameda Ave., Suite 360
Mission Viejo, California 92691
Telephone: (949) 282-1000
Facsimile: (949) 282-1002

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